

CLAIMS

1. A discharging solution for forming patterns on a surface of a base,
comprising organic molecules having fluoroalkyl chains as a first pattern
5 formation material,
wherein the surface tension of the solution is 20 dyne/cm or more.
2. The discharging solution according to claim 1, further comprising a second
pattern formation material.
- 10 3. The discharging solution according to claim 2, wherein the second pattern
formation material contains at least one kind of material selected from the
group consisting of a precursor of a metal-oxide dielectric, a semiconductor,
metal, and a polymer.
- 15 4. The discharging solution according to claim 3, wherein the second pattern
formation material is the metal and the metal is a metal colloid.
5. The discharging solution according to claim 3, wherein the second pattern
20 formation material is the polymer and the polymer is at least one kind
selected from the group consisting of a conductive polymer, a semiconductor
polymer, an insulting polymer, and a light-curable polymer.
6. The discharging solution according to claim 1, wherein the organic
25 molecules are at least one selected from the group consisting of: organic
molecules containing at least one group selected from a chlorosilyl group, an
alkoxy group, a mercapto group, a carboxy group, a hydroxy group, and an
amino group; organic molecules containing disulfide bonds; silazane; and

dithiol.

7. The discharging solution according to claim 1, wherein the organic molecules are at least one selected from the group consisting of molecules represented by a composition formula: $\text{CF}_3(\text{CF}_2)_n\text{C}_2\text{H}_4\text{Si}\{(\text{O}-\text{CH}_2\text{CH}_2)_m-\text{OR}^1\}_3$, and hydrolysate of the molecules, and

in the composition formula, R^1 is a methyl group, an ethyl group, a propyl group, or a butyl group, and n and m are natural numbers of 1 to 10.

8. The discharging solution according to claim 3, wherein the second pattern formation material is the precursor of the metal-oxide dielectric and the precursor of the metal-oxide dielectric is at least one selected from the group consisting of metal alkoxide, metal acetylacetonate, metal carboxylate, and a metal inorganic compound.

9. The discharging solution according to claim 5, wherein the polymer is the semiconductor polymer and the semiconductor polymer is at least one selected from the group consisting of polyalkylthiophene and poly-9,9'-dialkyl-fluorene-co-bithiophene.

10. The discharging solution according to claim 1, wherein a boiling point of a solvent contained in the solution is 80°C or higher.

11. A discharging solution for forming patterns on a surface of a base by an ink-jet method, comprising organic molecules having fluoroalkyl chains as a pattern formation material,

wherein a surface tension of the solution is 20 dyne/cm or more.

12. A method for producing patterns comprising:

discharging a solution having a surface tension of 20 dyne/cm or more,
in which organic molecules having fluoroalkyl chains are dissolved as a first
pattern formation material, to a surface of a base by an ink-jet method to
5 perform drawing; and

evaporating a solvent contained in the discharged solution to form
patterns containing the organic molecules.

13. The method for producing patterns according to claim 12, the solution
10 further comprising a second pattern formation material, the method
comprising evaporating a solvent contained in the discharged solution to form
patterns containing the organic molecules and the second pattern formation
material.

14. The method for producing patterns according to claim 13, comprising
evaporating a solvent contained in the discharged solution to form patterns
including a first pattern region containing a relatively large amount of the
organic molecules and a second pattern region containing a relatively large
amount of the second pattern formation material,

20 wherein the patterns are formed so that the first pattern region is
present on the base side with respect to the second pattern region.

15. The method for producing patterns according to claim 13, wherein the
second pattern formation material contains at least one kind of material
25 selected from the group consisting of a precursor of a metal-oxide dielectric, a
semiconductor, metal, and a polymer.

16. The method for producing patterns according to claim 15, wherein the

second pattern formation material is the metal and the metal is a metal colloid.

17. The method for producing patterns according to claim 15, wherein the
5 second pattern formation material is the polymer and the polymer is at least one kind selected from the group consisting of a conductive polymer, a semiconductor polymer, an insulting polymer, and a light-curable polymer

18. The method for producing patterns according to claim 12, wherein the
10 organic molecules are at least one selected from the group consisting of: organic molecules containing at least one group selected from a chlorosilyl group, an alkoxy group, a mercapto group, a carboxy group, a hydroxy group, and an amino group; organic molecules containing disulfide bonds; silazane; and dithiol.

15

19. The method for producing patterns according to claim 12, wherein the organic molecules are at least one selected from the group consisting of molecules represented by a composition formula:

$\text{CF}_3(\text{CF}_2)_n\text{C}_2\text{H}_4\text{Si}\{(\text{O}-\text{CH}_2\text{CH}_2)_m-\text{OR}^1\}_3$, and hydrolyzate of the molecules, and

20 in the composition formula, R^1 is a methyl group, an ethyl group, a propyl group, or a butyl group, and n and m are natural numbers of 1 to 10.

20. The method for producing patterns according to claim 15, wherein the
25 second pattern formation material is the precursor of the metal-oxide dielectric and the precursor of the metal-oxide dielectric is at least one selected from the group consisting of metal alkoxide, metal acetylacetonate, metal carboxylate, and a metal inorganic compound

21. The method for producing patterns according to claim 17, wherein the polymer is the semiconductor polymer and the semiconductor polymer is at least one selected from the group consisting of polyalkylthiophene and poly-9,9'dialkyl-fluorene-co-bithiophene
- 5
22. The method for producing patterns according to claim 12, wherein a boiling point of the solvent is 80°C or higher.
23. The method for producing patterns according to claim 12, wherein, when
10 the solution is discharged to the surface of the base, a surface temperature of the base is set to be lower by 5°C or more than a temperature of the solution to be discharged to the surface of the base.
24. A method for producing an electronic device comprising a method for
15 producing patterns that includes:
- discharging a solution having a surface tension of 20 dyne/cm or more, in which organic molecules having fluoroalkyl chains are dissolved as a first pattern formation material, to a surface of a base by an ink-jet method to perform drawing, the solution further containing a second pattern formation
20 material; and
- evaporating a solvent contained in the discharged solution to form patterns containing the organic molecules and the second pattern formation material.
- 25 25. The method for producing an electronic device according to claim 24, wherein the second pattern formation material is at least one kind of material selected from the group consisting of a precursor of a metal-oxide dielectric, a semiconductor, metal, and a polymer, and

the electronic device is at least one selected from the group consisting of metal wiring, an electrode, a transistor, a resistor, a capacitor, a microlens, and an imaging device.

- 5 26. An electronic device comprising a base and patterns formed on a surface of the base,

wherein the patterns include a first pattern region containing organic molecules having fluoroalkyl chains and a second pattern region containing at least one selected from metal, a semiconductor, a metal oxide, and a

- 10 polymer,

the first pattern region and the second pattern region are stacked in this order on the surface of the base, and

a shape of the first pattern region is similar to a shape of the second pattern region.

15

27. The electronic device according to claim 26, wherein the first pattern region is a monomolecular film of the organic molecules.